

## COMPARISON OF STAFF TRAINING STRATEGIES TO PROMOTE GENERALIZED TEACHING SKILLS

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Two studies compared the effectiveness of different strategies for promoting generalization of staff skills in teaching self-care routines to clients with developmental disabilities. In Study 1, 9 direct-care staff members of group homes were trained sequentially through four conditions: (a) the provision of written instructions, (b) performance-based training using a single client program exemplar and simulated clients (single case training), (c) performance-based training using actual developmentally delayed clients as trainees (common stimuli training), and (d) performance-based training using multiple client program exemplars with simulated clients (general case training). The results indicated that staff members did not reach all generalization criteria until general case training was provided. Because staff members had been trained sequentially through several conditions in Study 1, a second study controlled for potential sequence effects. In Study 2, 7 staff members were trained using only the general case strategy after baseline. All staff members reached generalization criteria with only general case training, replicating the findings of Study 1. Together, the two studies demonstrated that the general case training strategy was more effective at promoting generalized training effects across clients, settings, and client programs than other commonly used staff training approaches.

**DESCRIPTORS:** staff training, generalization, developmentally disabled adults, general case training, self-care skills

Although a powerful technology for teaching new skills to persons with developmental disabilities is currently available, the potency of these training procedures is dependent on precise and consistent implementation by mediators (e.g., direct-care staff, parents, teachers); effective mediator training strategies are therefore essential (Kazdin, 1984; Page, Iwata, & Reid, 1982). Several studies have been conducted to determine which training strategies are most efficient in promoting acquisition of teaching skills by mediators (e.g., Gardner, 1972; Gladstone & Spencer, 1977). Strategies for promoting generalization of newly learned mediator skills across the various situations and settings in which client behavior change is desired have received much less

attention, however (Kazdin, 1984; Whitman, Scibak, & Reid, 1983).

In the staff training literature, for example, those few studies in which generalization was measured reported mixed results. In several studies, meaningful generalization across client skill programs, settings, and clients was achieved (e.g., Gladstone & Spencer, 1977; Ivancic, Reid, Iwata, Faw, & Page, 1981; Koegel, Russo, & Rincover, 1977), whereas in others, poor, inconsistent, or no generalization was reported (e.g., Duker & Seys, 1980; Kissell, Whitman, & Reid, 1983; Page et al., 1982).

Several different techniques used to program for generalization in behavior-change efforts for individuals with developmental and related disabilities may also hold some promise for promoting generalization of mediator skills. One method, using common stimuli (Stokes & Baer, 1977), involves making the treatment and generalization settings as similar as possible by duplicating the most important stimulus aspects of the generalization environment in the therapy setting (Martin, England, Kaprowy, Kilgour, & Pilek, 1968; Rincover & Koegel, 1975) or by introducing elements of the treatment setting into the generalization situation

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(Koegel & Rincover, 1974). Although one specific form of this generalization strategy, training in the natural environment, is often recommended in the mediator training literature (e.g., Page et al., 1982; Whitman et al., 1983), its efficacy in enhancing generalization of mediator skills has yet to be demonstrated.

A second strategy for promoting generalization, referred to as "general case" training (Becker, Englemann, & Thomas, 1975; Day & Horner, 1986; Horner, Sprague, & Wilcox, 1982), is closely related to the procedure of "training sufficient exemplars" (Stokes & Baer, 1977). With the general case technique, however, the procedures for selecting examples to be trained are made explicit. Multiple teaching examples are carefully chosen to sample the span of stimulus and response variation that defines the "instructional universe" of the skill to be trained (Day & Horner, 1989; Horner, McDonnell, & Bellamy, 1986; Sprague & Horner, 1984). To our knowledge, the general case strategy has not been evaluated in the staff training literature.

Because there are few studies evaluating techniques for promoting the generalization of mediator skills and even less research comparing generalization strategies, the present study was designed to compare the common stimuli and general case approaches for their effectiveness in enhancing generalization of mental retardation direct-care staff skills across clients, client programs, and settings.

In Study 1, staff skills were measured in baseline, and staff members were subsequently trained and evaluated through the following training conditions: (a) written instructions (provision of a written description of all client training procedures), (b) single case training (using only one, rather than multiple, client program examples), (c) common stimuli training (using real rather than role-played clients during staff training), and (d) general case training (using multiple, specially selected client program exemplars during staff training).

Because some staff training studies (e.g., Gladstone & Spencer, 1977; Ivancic et al., 1981) have achieved generalization without specifically pro-

gramming for it, the written instructions and single case conditions were included to determine if these strategies, which (unlike common stimuli and general cases) do not specifically program for generalization, would be sufficient to produce generalized responding with the direct-care staff. Further, because of the fixed sequence of training conditions to which all staff members were exposed in the first study, Study 2 was added as a control for order effects. In Study 2, the training strategy found to be most effective in Study 1 was employed with new (i.e., untrained) staff, immediately after baseline, to determine if this strategy would be as effective without the preceding training conditions.

## STUDY 1

### METHOD

#### *Participants and Setting*

Study 1 was conducted in two residential group home sites (A and B) that were part of a four-group home complex run by a private, nonprofit agency providing services to adolescents and adults with developmental disabilities. The direct-care staff of these sites served as participants. Their job was to provide custodial care as well as training and treatment to the developmentally delayed clients.

Nine direct-care staff members (all female) were involved in Study 1. They ranged in age from 21 to 30 years and in level of education from a 2-year community college diploma (Developmental Services Worker) to a bachelor of arts degree. Length of time employed by the agency ranged from 2 months to 8 years.

Sites A and B were selected based on the availability of staff and clients. Each of these sites served as a residence to eight individuals with developmental disabilities, ranging in age from 13 to 24 years. The residents of Site A ranged in functioning level from moderate to severe mental retardation, whereas those in Site B ranged from moderate to profound mental retardation. These clients were deficient in a wide range of skills; from basic self-care skills (e.g., hygiene, dressing) for the lower

functioning individuals to deficits in more advanced community living skills (e.g., housekeeping, counting money) for the higher functioning persons.

Those training sessions in which one of the client program exemplars used to train the staff member involved the use of a sink and running water (e.g., toothbrushing, handwashing) were run in the wash-room area of the homes. The washrooms were large enough to accommodate one trainer and up to 6 staff members, who were seated on chairs around the sink when they were not actively involved in training. The other training sessions were carried out in a room that was typically used for recreation and watching television. This room was set up with a table for demonstration of specific program exemplars (e.g., table setting, folding towels, coin identification) and chairs to accommodate all staff members taking part in the training.

### *Staff Dependent Measures*

To evaluate staff skills throughout all phases of the study, staff members were videotaped carrying out training sessions with the clients they were responsible for teaching. These sessions took place in the natural environment (the homes), where the training of the clients usually occurred. Staff skill categories were scored from these videotapes. Observers were naive with respect to the experimental conditions.

Staff skill categories were selected based on research showing that the combination of these skills, when exhibited by staff members during client training sessions, would promote skill acquisition in persons with developmental disabilities (e.g., Doyle, Wolery, Ault, & Gast, 1988; Gardner, Brust, & Watson, 1970; Koegel et al., 1977; Koop, Martin, Yu, & Suthons, 1980; Watson, 1974). Event recording was used to code these skill categories. The beginning of each training event was signaled by the staff person's initiation of activity directed towards client training. The end of the training event was signaled by a 15-s (or longer) period during which all program-related activities were terminated or by a return of the staff person

to an earlier point in the sequence of the particular client skill being trained.

Each staff skill category within an event was scored as either correct or incorrect, with the exception of one category, "Uses physical prompts correctly," which could also be scored as inapplicable (see below). The categories and their operational definitions were as follows:

1. Prepares the training area. The staff person ensures that the training area is free from disturbances, and that all necessary materials (e.g., towels, soap) are available for the training session.

2. Gives instructions correctly. The staff person provides an initial instruction that clearly specifies the whole task being required of the client (e.g., "Put on your shirt"). The staff person should not (a) use the whole task instruction more than three times prior to task initiation by the client, (b) repeat the whole task instruction after the client has initiated the task, or (c) use prompts either before or instead of the instruction.

3. Uses least intrusive prompts. The staff person uses less intrusive prompts (e.g., verbal, gestural, modeling) before using physical guidance.

4. Times prompts correctly. If the client is not working effectively towards completion of the task, the staff person waits 5 to 10 s between each prompt to give the client time to respond to the instruction or the prompt.

5. Uses physical guidance correctly. The staff person places her hand over the client's hand, wrist, forearm, or elbow and helps the client perform the desired behavior. The staff person does not execute any aspect of the task to be trained for the client (e.g., picking up the toothbrush and placing it in the client's hand rather than having the client pick up the toothbrush for himself or herself). This category is scored as inapplicable if the client performs the task without requiring physical guidance.

6. Uses contingent reinforcement. The staff person provides a tangible reward or statement of praise within 5 s of the client successfully completing the task (with or without assistance).

7. Provides a praise statement. The staff person provides a statement of approval or praise, even if

it is in a nonenthusiastic or conversational tone, to the client upon task completion.

8. Provides enthusiastic praise. The staff person provides enthusiastic praise, in a pleasant, louder than conversational tone. (Both Categories 7 and 8 were included so that the coding system would discriminate between a failure to make a praise statement and a failure to use an enthusiastic tone when making the praise statement.)

9. Records response correctly. The staff person records the level of prompting required for the client to make the correct response after task completion.

10. Uses discrete training trials. The staff person provides a distinct onset and offset, with a discrete intertrial interval (Koegel et al., 1977) lasting at least 15 s, during which time no training demands are placed on the client.

For each staff person, the percentage of correct skill use during each training session was calculated by totaling the number of correct skills and dividing by the total number of correct and incorrect skills, across all of the training events implemented during that session, and multiplying by 100. Overall percentage of correct use of individual skill categories was also calculated for all staff members. This was done by totaling the number of times a skill occurred correctly in each condition for all staff members, dividing it by the total number of times the skill was used correctly and incorrectly by all staff members, and multiplying by 100.

### *Interobserver Agreement*

Interobserver agreement was obtained by two independent observers during videotape coding sessions. Both observers remained naive to the experimental conditions. Interobserver agreement was obtained on 23% of sessions (16% of baseline, 42% of the written instructions condition, 24% of the single case condition, 19% of the common stimuli condition, and 21% of the general case condition). These sessions were randomly selected from each of the conditions, across all staff. Percentages were obtained by dividing the number of agreements by the total number of agreements plus disagreements in a particular condition and then multiplying by 100. An agreement was tallied when both observers

independently scored a category the same (i.e., either correct or incorrect). Agreements on the absence of physical assistance were not included as agreements when calculating interobserver agreement to avoid artificially inflating the interobserver agreement scores, because many of the training sessions did not involve the use of physical assistance.

Overall interobserver agreement across all staff skill categories averaged 95% for baseline (range, 80% to 100%), 94% for the written instructions condition (range, 75% to 100%), 96% for the single case condition (range, 93% to 100%), 97% for the common stimuli condition (range, 93% to 100%), and 98% for the general case condition (range, 95% to 100%).

### *Design*

A multiple baseline across groups of staff was used (Barlow & Hersen, 1984). Group 1 ( $n = 4$ ) was comprised of staff members from each of the two training sites and was selected on the basis of availability for specific training sessions from the 9 full-time staff members involved in Study 1. Group 1 subjects were evaluated in baseline and were then provided with sequential group training and evaluation in several conditions: written instructions, single case, common stimuli, and general case. Group 2 ( $n = 5$ ) received the same sequence of training as the first group. For this group, the baseline was extended for approximately 1 week in multiple baseline fashion.

The programs targeted for clients during the staff skill evaluation sessions were selected prior to baseline and were based on individual client needs. Each staff member was scheduled to implement three client training programs (e.g., toothbrushing, buttoning, putting on pants) with three different clients. Of the three programs, the staff member was required to carry out one program on which she would receive specific training during the training sessions (within-program generalization probe) and two others on which she would receive no specific training (across-program generalization probes). The within-program generalization probes (either toothbrushing or handwashing for all subjects) provided

a measure of staff skill acquisition with respect to the program dimension. Thus, when the staff person was trained directly to teach toothbrushing to a client, we monitored, during the skill evaluation sessions, how well the staff person had acquired the skill of teaching toothbrushing. The within-program generalization probe also provided a measure of skill generalization with respect to the setting and client dimensions, because the probes were carried out in different settings and with different clients than in the training sessions. The across-program generalization probes provided a measure of skill generalization across all three dimensions—program, setting, and client. Generalization for the program dimension was assessed because staff members were being evaluated on programs different than those included in training. The setting and client dimensions were measures of generalization in the same manner as the within-skill generalization probes.

### *Staff Training Procedures*

**Baseline.** Prior to training, staff members were videotaped carrying out training sessions with clients, as previously described. Before the camera was turned on, staff members were asked to do whatever they would typically do in order to teach the preselected program to the client.

**Written instructions condition.** After subjects had been observed implementing several client training sessions in baseline, they were provided with a package of materials containing information on how to implement client training programs, covering all of the dependent measures listed above, and a set of task analyses for each of the programs on which they were being observed. Staff members were required to read the materials during a scheduled time in the presence of the first author, and were provided with the opportunity to ask questions about the client training procedures.

**General training procedures.** The procedures in this section were common to all ensuing training conditions. The subjects were trained in groups of 5 or 6. The groups included part-time or weekend staff members, who were not included as participants in this study. All training was conducted by

the first author (subsequently referred to as the staff trainer), who used a combination of modeling, rehearsal, and feedback procedures commonly used in the mediator training literature (e.g., Flanagan, Adams, & Forehand, 1979; Jones & Eimers, 1975; Moreland, Schwebel, Beck, & Wells, 1982).

At the beginning of the training session, the staff trainer demonstrated the procedures that should be used when teaching the client, including all of the skills that were being evaluated in the skill evaluation sessions. Each staff member was asked to come to the front and play the role of the client as the staff trainer modeled the procedures. Correct and incorrect ways of using the skill were demonstrated. After the modeling of the client training procedures, the staff trainees were required to rehearse the skills just observed while the staff trainer role-played the client to be trained (except in the common stimuli condition; see below). While the staff trainees were rehearsing these procedures, the staff trainer provided feedback on their performance. This feedback included praise and positive comments after correct performance and suggested alternative responses after incorrect performance. All training sessions were approximately 3 hr in length.

**The single case condition.** The staff trainer used only one specific client program (i.e., either toothbrushing or handwashing) as an example for demonstrating skills in this condition. The program example used in the training session was the same client program on which staff trainees were being videotaped during the within-program generalization evaluation sessions. This condition was included as a control for the possibility that subjects were able to generalize their training skills after performance-based training in which no specific programming for generalization was implemented. The single case condition thus provided a comparison with both the use of real clients in training, as used in the subsequent common stimuli condition, and the use of multiple client program exemplars, as used in the subsequent general case condition.

**The common stimuli condition.** The common stimuli condition was identical to the single case

condition with one exception. Rather than the staff trainer or one of the subjects playing the role of the client, actual clients who resided at the training sites were included in the training session. Although the staff members worked with clients in this condition, they never received training on the same client/program combinations that served as the generalization probes.

*The general case condition.* In the general case condition, we attempted to present the subjects with a broad enough range of client program exemplars during training that they would have the skills to provide training for any program needed by the client. We were thus attempting to sample the "instructional universe" (Horner et al., 1986) of skills needed to implement training with any program exemplar. With staff input, a list of approximately 40 programs on which clients required training was developed. From this list, 12 teaching programs were selected that best sampled the range of client programs domains (e.g., hygiene, dressing) that are functionally important for individuals with skill deficiencies and that also sampled the range of responses that staff members would have to exhibit when teaching the client a program from a particular domain. The program exemplars chosen for inclusion were putting on a shirt, doing up snaps, hanging a shirt on a hanger, folding towels, taking off a t-shirt, lacing shoes, shaving, brushing hair, cleaning a window or mirror, table setting, coin identification, and either handwashing or toothbrushing, which were designated as the within-program generalization probes for each staff. The only client programs not considered as potential exemplars in the general case training session were those programs being monitored as across-program generalization probes in the skill evaluation sessions.

*Follow-up.* Follow-up measures of staff performance on the within-program and across-program generalization probes were scheduled to be collected 6 months after the last general case training session. At follow-up, however, only 1 staff person was available for evaluation, because the others had left the agency.

## RESULTS AND DISCUSSION

### *Staff Data*

The data for all staff members are presented in Figures 1 and 2. Subjects A, B, E, and F were in Group 1; Subjects C, D, G, H, and I constituted Group 2. The criterion level of 85% correct skill use was selected because our previous work (Feldman, Bowman, & Ducharme, 1980) indicated that staff members were unlikely to be effective trainers below this level. Baseline rates for within- and across-program generalization probes were highly variable (Figures 1 and 2). The mean percentage correct across all staff members for within-program generalization was 27.8%, and for across-program generalization, 36.5%. (Although most staff trainees were evaluated on two across-program generalization programs, the data for both probes were combined in all across-program generalization means, so that an overall comparison of within-program versus across-program data could be made.) It is clear from the single-subject data and the mean percentage correct across all subjects (38.7% for within-program generalization and 40.9% for across-program generalization) that the provision of written instructions had little effect on the skill level of the subject being trained, although in some cases there was a discernible increase in skill level from baseline after the provision of written instructions (e.g., Subject B).

Single case training resulted in a substantial jump in skill level for both within-program and across-program generalization probes. In most cases, however, subjects consistently performed below criterion levels. There was also a slight tendency for staff members to respond better on the within-program generalization probes (mean across all subjects = 79.5% correct) than on the across-program generalization probes (mean across all subjects = 67.4% correct).

In the common stimuli condition, the difference between within-program and across-program generalization data became more pronounced. Subjects reached criterion on 18 of the 25 within-program generalization sessions (75%) but only 5 of the 43

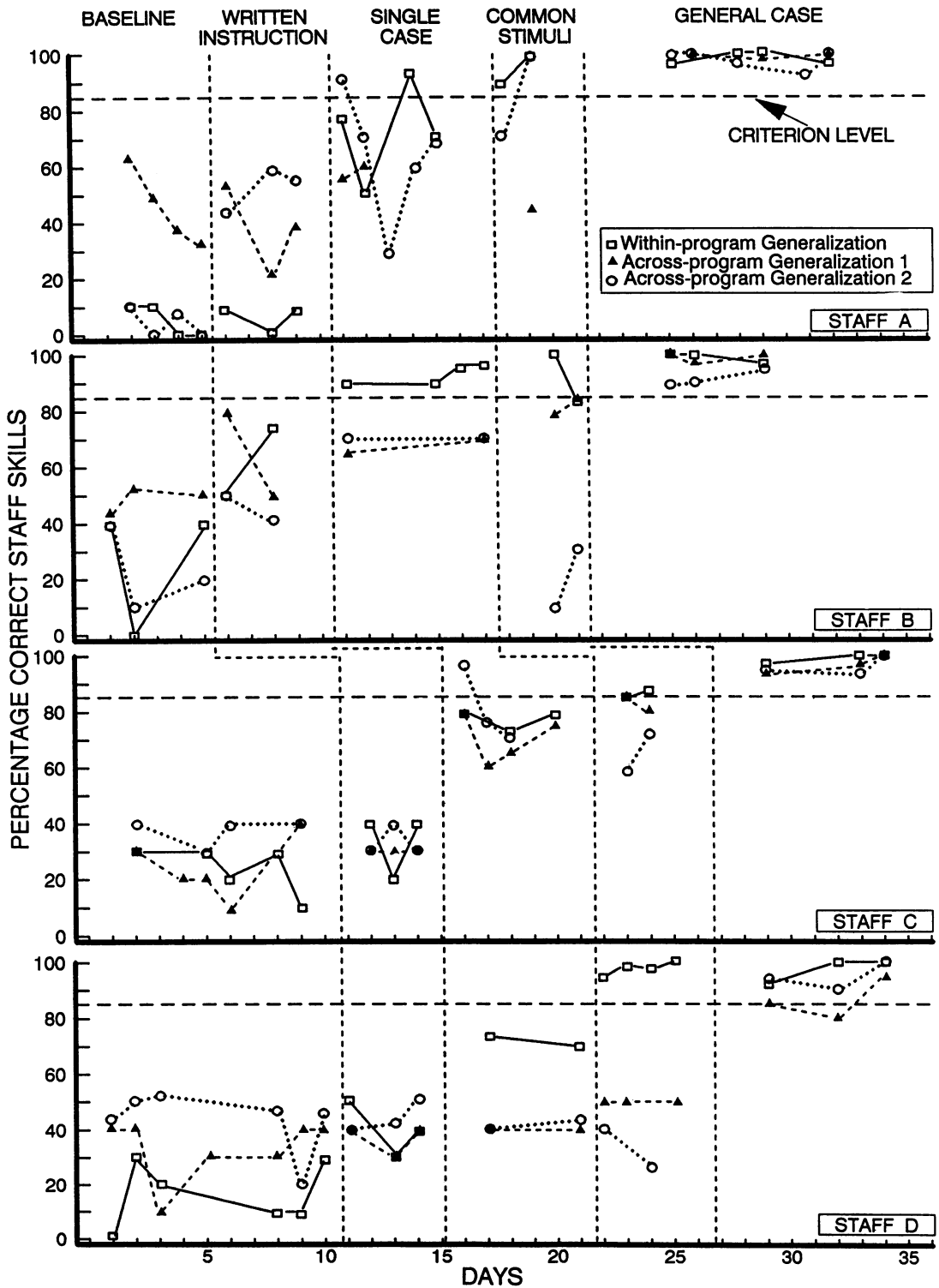


Figure 1. Percentage of correct skills per session across all conditions and programs for Subjects A and B (Group 1) and Subjects C and D (Group 2).

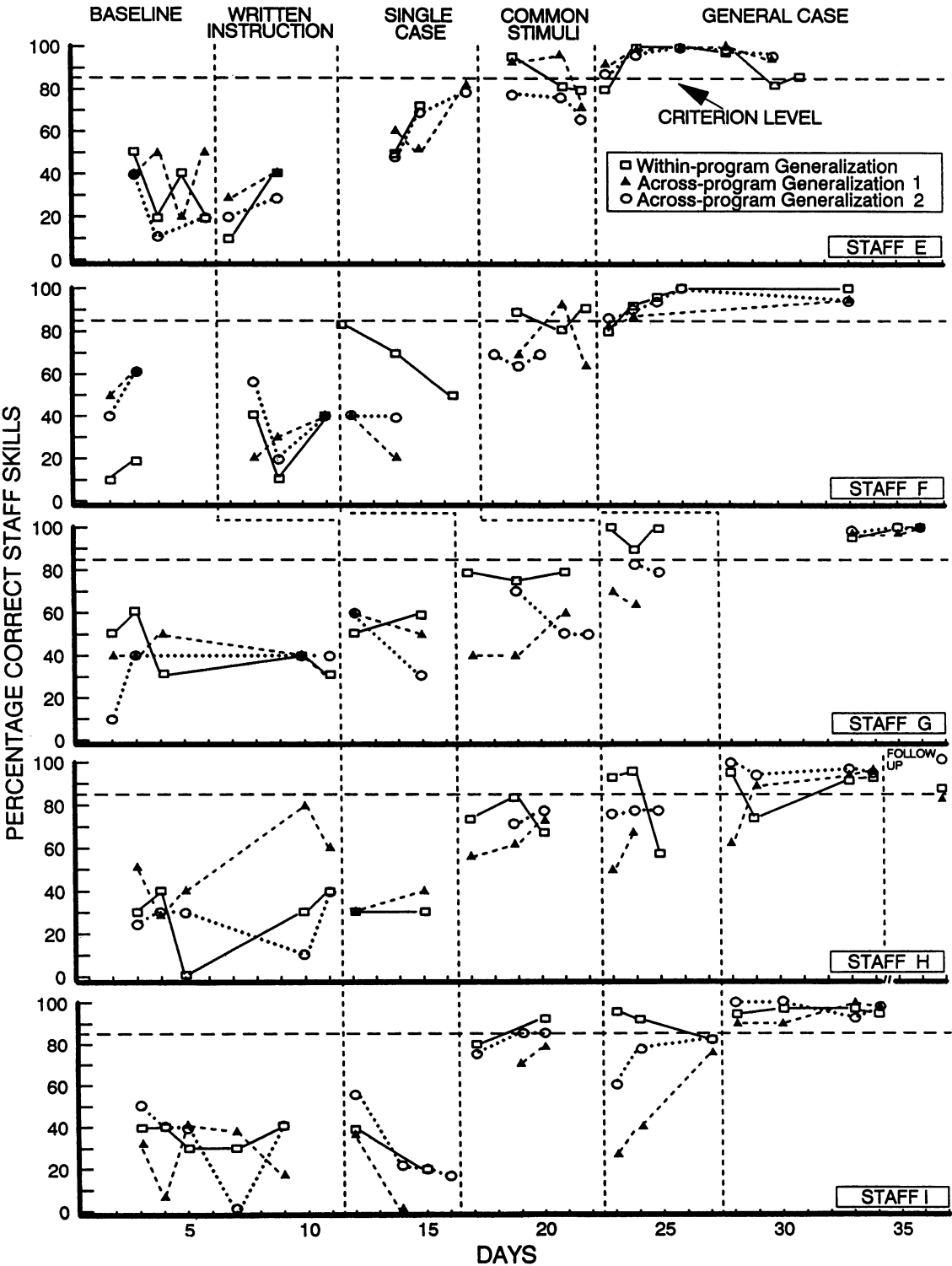


Figure 2. Percentage of correct skills per session across all conditions and programs for Subjects E and F (Group 1) and Subjects G, H, and I (Group 2).



across-program sessions (12%). The mean across all staff members for within-program generalization was 91.1% correct, and was 69.2% correct for across-program generalization.

The general case condition resulted in a marked increase in across-program generalization probe levels to above criterion ( $M = 95\%$  correct). Within-program generalization rates remained above criterion ( $M = 94.7\%$  correct) (Figures 1 and 2).

Only one staff member remained 6 months after the completion of training. This person maintained criterion level performance on both the within-program and across-program generalization probes in the 6-month follow-up session.

### *Individual Category Data*

The individual category data closely mimicked the staff data in almost all categories. In 9 of 10 staff skill categories, both within-program and across-program generalization scores exceeded criterion level in the general case condition. Only in Category 5, "uses physical assistance correctly," did both within-program and across-program generalization means fail to reach criterion. One possible explanation for this finding is that the subjects were trained to use physical guidance only after trying verbal, gestural, or modeling prompts. One might speculate that subjects performed with less mastery in this category because they had less opportunity to practice this skill.

For all of the skill categories, within-program generalization means did not exceed criterion in the written instructions condition. Within-program means rose above criterion after single case training in 4 of 10 skill categories. After common stimuli training, within-program generalization means were above criterion in 7 of 10 skill categories. For every skill category, however, neither written instructions, single case training, nor common stimuli training brought the means for across-program generalization probes above the criterion level of responding.

## STUDY 2

The second study was conducted to control for possible sequence effects in Study 1. Because the

general case strategy produced the most generalization in Study 1, this condition was run directly after baseline, without any of the intervening training strategies used in the first study, in an effort to replicate prior effects. The intent was to determine whether the gains made in the general case condition were due to the potency of the general case strategy or to the combined effects of the number of training sessions and/or the various training strategies employed.

## METHOD

### *Participants and Setting*

Seven (6 female, 1 male) direct-care staff members of the two remaining residential group homes (Sites C and D), comparable in age and experience to those in Study 1, participated in Study 2. Their ages ranged from 21 to 25 years. Staff members had either a 2-year community college diploma or a bachelor of arts degree. Length of employment ranged from 2 weeks to 4 years.

Eight individuals with developmental disabilities lived at each training site. Their ages ranged from 16 to 24. Site C residents had moderate to severe mental retardation, and those residing at Site D had mild to moderate retardation. The settings in which the training sessions were implemented were also comparable to those used in Study 1.

### *Staff Dependent Measures*

The evaluation procedures and dependent measures for staff and clients were identical to those used in Study 1. As in the first study, all staff members were assigned three client training programs: one within-program generalization probe and two across-program generalization probes. An exception was Subject M, who was assigned only one across-program generalization probe because of scheduling difficulties.

### *Interobserver Agreement*

Interobserver agreement sessions were also implemented as in Study 1. Interobserver agreement was obtained for 45% of the client training sessions, across all subjects, and covered 33% of baseline

and 57% of general case sessions. The overall interobserver agreement mean across all skills was 95% for baseline, ranging from 77% to 100%, and 99% for the general case condition, ranging from 89% to 100%.

### *Design*

As in Study 1, a multiple baseline across groups of staff was used in Study 2. Group 3 ( $n = 4$ ) was evaluated in baseline before receiving only general case training. Group 4 ( $n = 3$ ) also received only general case training, but the baseline was extended 2 weeks in multiple baseline fashion, as in Study 1.

### *Staff Training Procedures*

**Baseline.** Baseline procedures were identical to those used in Study 1.

**General case condition.** All of the general training and general case procedures from Study 1 were duplicated in Study 2.

**Follow-up.** Five of 7 staff members from Study 2 were available for follow-up. A 3-month follow-up period was used in this study because of the high staff turnover problem experienced for the 6-month follow-up in Study 1.

## RESULTS AND DISCUSSION

### *Staff Data*

The staff skill data for all subjects in Study 2 are presented in Figures 3 and 4. Subjects J, M, and N were trained together in Group 3, and Subjects K, L, O, and P constituted Group 4. The baseline levels were highly variable, as was the case in Study 1. The mean percentage correct across all staff for within-skill generalization was 24.6%, and for across-skill generalization was 35% (Figures 3 and 4). Both of these levels were comparable to baseline levels in Study 1. When the general case training strategy was implemented, responding during both the within-program and across-program generalization sessions jumped to criterion levels, with few exceptions. The mean percentage correct skills across all subjects for within-skill generalization was 98%, and for across-skill generalization

was 96%. This change replicated the findings of Study 1. The general case strategy was highly effective at producing criterion levels of generalization across clients, settings, and client programs, even when the general case condition was not preceded by other training strategies, as it was in Study 1. The 3-month follow-up scores of the 5 available subjects (4 from Group 3 and 1 from Group 4) showed maintenance of criterion levels on both within-program and across-program generalization probes.

### *Individual Category Data*

The individual category data indicated that staff skills on both within-program and across-program generalization probes shifted from below criterion in baseline to well above criterion after general case training was provided, for all skill categories except one (Category 5: uses physical assistance correctly). This finding was highly consistent with the general case results of Study 1.

## GENERAL DISCUSSION

The present research demonstrated, in two studies with 16 staff members, that general case training was more effective than other commonly used and recommended staff training strategies for promoting acquisition and generalization of skills across client programs, settings, and clients. In Study 1, consistent criterion levels of within-program and across-program generalization were produced only in the general case condition. In Study 2, the general case training strategy again produced criterion levels of generalization, in the absence of the additional training conditions that had preceded it in the first study. Thus, this study provided one of the first demonstrations that the general case strategy is an effective approach to promoting generalization of mediator skills.

The general case strategy was not only effective in promoting generalization of staff skills, but was also efficient. In approximately 3 hr, a group of up to 6 staff members learned the range of teaching skills that characterize an effective instructor and learned how to generalize those skills to client pro-

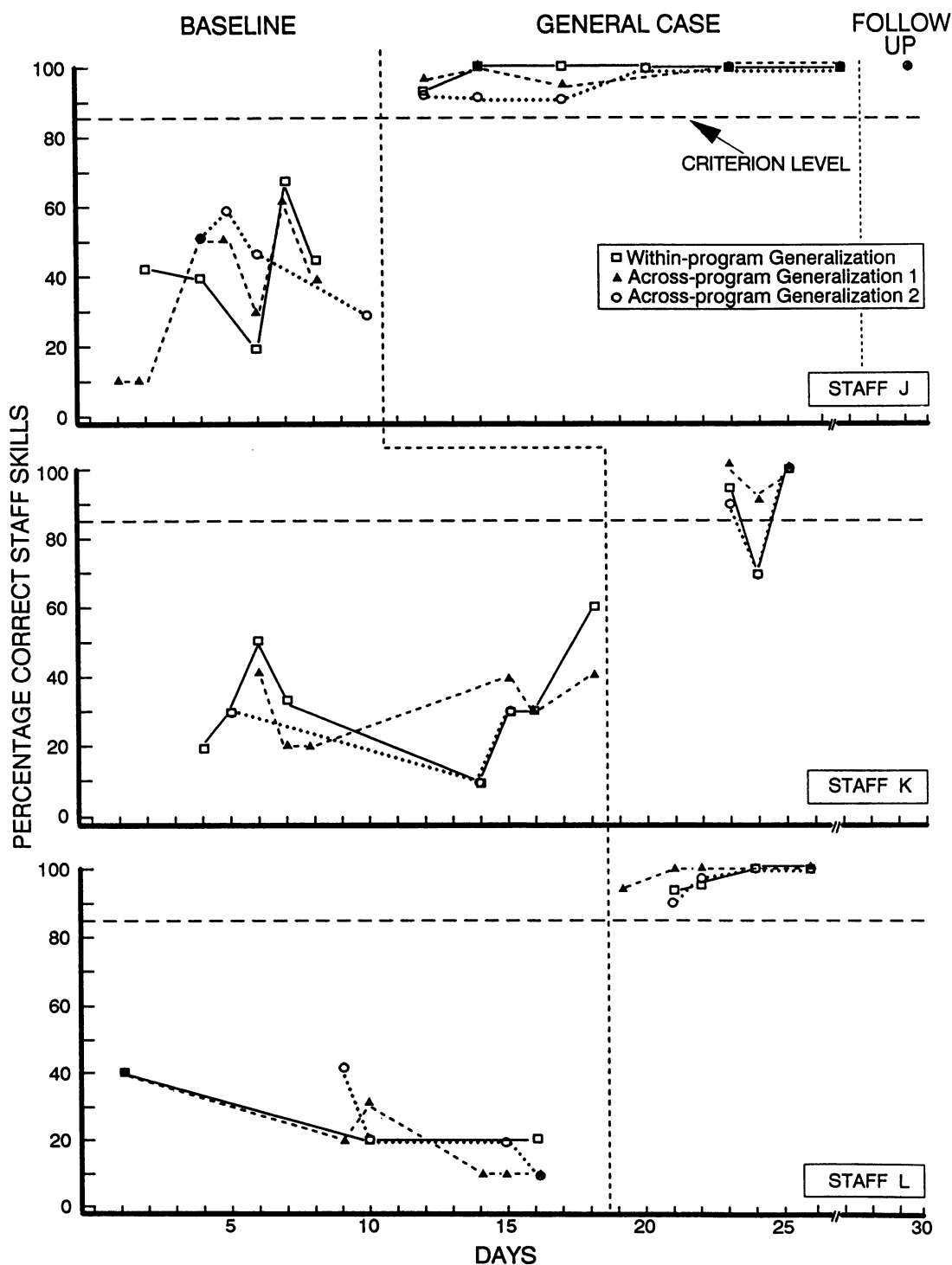


Figure 3. Percentage of correct skills per session across all conditions and programs for Subject J (Group 3) and Subjects K and L (Group 4).

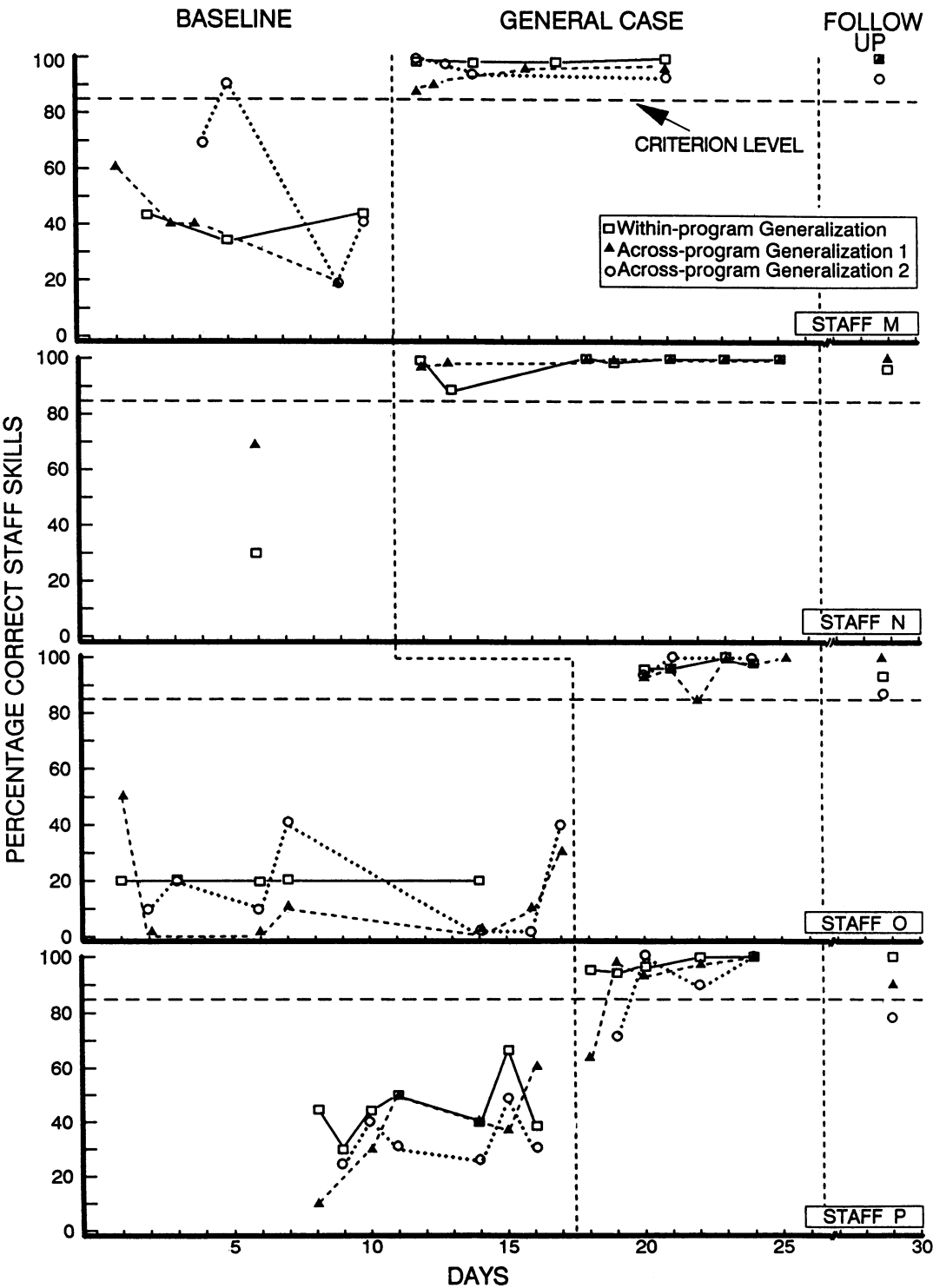


Figure 4. Percentage of correct skills per session across all conditions and programs for Subjects M and N (Group 3) and Subjects O and P (Group 4).

grams, settings, and clients other than those included in training.

The two control conditions (written instructions and single case training) were not sufficiently effective to warrant recommendation. The use of written instructions was shown to be generally ineffective in producing behavior change, a finding that was anticipated based on research showing that staff training methods that are not performance based may change the written and verbal skills of staff members, but will do little to improve the actual performance of skills (e.g., Adams, Tallon, & Rimmell, 1980; Gardner, 1972; Quilitch, 1975). Single case training, although not specifically designed to promote generalization, did produce some increases in generalized staff responding in the present research (cf. Gladstone & Spencer, 1977; Ivancic et al., 1981). These gains were not consistent, however, and rarely reached criterion levels.

The common stimuli condition in Study 1 also produced some generalization increments. It is not possible to determine from the present design, however, whether this strategy was actually more effective than single case training or whether the increases in staff skill were attributable to the experimental history and/or the sequential nature of training.

The finding that general case training produced greater levels of across-program generalization than common stimuli training is an interesting one, because authors writing on programming for generalization in mediator training efforts (e.g., Page et al., 1982; Whitman et al., 1983) have stressed the importance of making the training situation as similar to the natural setting as possible to promote optimal levels of generalization. In the present study, however, the incorporation of real clients into the staff training session in the common stimuli condition, to increase the similarity between the staff training and on-the-job environments, did not enhance across-program generalization above the level that had already been obtained in the single case condition. A contribution of the present study was the demonstration that staff training can be completed in a simulation format (i.e., with the role of

the clients to be trained being played by staff trainers or other staff) and still produce robust generalization across client, setting, and program dimensions when the general case strategy is incorporated. This finding is consistent with a recent study by Neef, Lensbower, Hockersmith, DePalma, and Gray (1990), in which the general case training strategy was superior in promoting generalization of skills with developmentally delayed clients to the single case strategy, regardless of whether training was done in simulation or in naturalistic formats, which did not differ significantly from each other in terms of client gains.

In an effort to explain the differential effectiveness of general case and common stimuli training in the present research, it is useful to consider the different generalization modalities across which generalization was examined. Because the common stimuli condition was designed to make the training and generalization environments similar through the use of actual clients, this training approach would be expected to promote generalization across the setting and client generalization modalities. It would not necessarily be expected to enhance generalization across client programs, because the program variable was not manipulated in the common stimuli condition. The results, in fact, support these expectations, because the common stimuli condition produced criterion level changes in the within-program generalization probes, which were primarily measures of generalization across settings and clients, but not in the across-program generalization probes, which were measures of generalization across, settings, clients, and programs.

The general case strategy, on the other hand, was specifically designed to address the issue of generalization across programs, because it involved a manipulation of only the program modality. Therefore, this training strategy was expected to improve performance on the across-program generalization probes, which included a measure of generalization across programs. Again, this is what occurred in the present research. It should be reiterated, however, that although it was designed to promote generalization across client programs, the

general case approach was effective at inducing generalization across settings and clients as well, as assessed by both within-program and across-program generalization probes.

The 3- and 6-month follow-up data indicated that the remaining staff members were able to retain the skill levels they achieved during general case training. Criterion skill levels were maintained in almost all of the within-program and across-program generalization probes. The follow-up results must be qualified, however, because they are based solely on the 6 staff members who remained at the agency during the follow-up periods, thus creating a possible selection bias.

Given the relatively small number of client training sessions that occurred during the present study and the considerable amount of time that is typically required to teach community living skills to individuals with developmental disabilities (Whitman et al., 1983), we did not expect to see substantial client gains. An examination of the videotapes of program sessions, however, produced encouraging evidence of skill acquisition. Sixty-six percent of the clients were able to progress by one or more program steps after staff training had occurred. It should be noted, however, that the design of the study and the length of time spent in each condition do not allow firm conclusions to be drawn about client learning. This awaits further research.

Several studies over the past decade have shown that the general case approach can produce generalization of functional skills in clients with developmental disabilities (e.g., Day & Horner, 1986; Horner, Bellamy, & Colvin, 1984; Horner, Jones, & Williams, 1985; Horner & McDonald, 1982; Steere, Strauch, Powell, & Butterworth, 1990; Sprague & Horner, 1984). The findings of the present study both support and extend these results with the demonstration that direct-care staff can reap similar benefits from this approach. Future investigations should be aimed at demonstrating the effectiveness of this promising generalization strategy across diverse dimensions of generality, such as different mediators, clients, settings, and behaviors.

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